

On the Nomenclature of *Colias alfacariensis* Berger 1948 (Lepidoptera: Pieridae)

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Abstract. The nomenclature of the butterfly usually called *Colias australis* is discussed in chronological order, with comments regarding the relevant papers published by other authors. The valid name for the species, its author and date of publication are established, this being *Colias alfacariensis* Berger 1948.

"Berger's Clouded Yellow" has usually been called "*Colias australis*" and its authorship has usually been attributed to "Verity 1911." However, two other names—" *Colias alfacariensis*" and "*Colias calida*"—have also been used for the species, and their authorship attributed mainly to "Ribbe, 1905" and "Verity, 1916", although some other authors have also been occasionally quoted, e. g. Berger, 1948; Berger & Fontaine, 1948 and Verity, 1923. Kocak (1981) in his painstaking examination of the nomenclature of the European butterfly species, was already fully aware of the unavailability of the name *australis* in connection with Verity's authorship dated 1911 (Verity, 1905-11); Kocak apparently presumed that the name *australis* was made available later, elevated to the species-group rank by an unspecified author at an unspecified date to become the senior subjective synonym, and consequently the valid name, for the species. Dutreix (1981) retained the name and authorship as "*Colias australis* Verity 1911" but his useful compilation of the literature on the species helped in the search for the correct name of the species. Blab & Kudrna (1982) already employed the correct name, author and date of publication *Colias alfacariensis* Berger 1948; they did not explain the reasons behind their action as to do so was beyond the scope of their work.

A chronological order has been chosen as being the most opportune method to elucidate the complex taxonomic and nomenclatural history of "Berger's Clouded Yellow." Throughout the paper on several occasions a reference is given to the International Commission on Zoological Nomenclature and to the International Code of Zoological Nomenclature; to save space the former is abbreviated ICZN and the latter simply "Code". I have the pleasure of thanking R. V. Melville (ICZN, London), G. Bernardi (Museum National d'Histoire Naturelle, Paris), A. O. Kocak (Ankara University, Ankara) and Ichiro Nakamura (USA) who at various times

discussed with me some aspects of zoological nomenclature and/or provided valuable advice which in part concerned also some problems related to this paper.

Ribbe (1905) described an aberration of *Colias hyale* Linnaeus 1758 and named it *alfacariensis*. His type-material came from the mountains Sierra de la Yedra (ca. 1800 m) just north of the village Alfacar situated north of Granada, in southern Spain (i.e. Andalusia); he called this mountain range incorrectly 'Sierra de Alfacar' after the above mentioned village which he used as his base and this name became subsequently very widespread in entomological literature, particularly in the German language. The taxonomic category 'aberration' has been used either for some kind of individual form (s.l.) or for various extreme forms ranging often as far as pathological and teratological individuals. "Aberration" is not among the taxonomic categories recognized by the ICZN. The rank of any aberration is therefore to be interpreted as infrasubspecific and, consequently, the names originally proposed for aberrations are unavailable. Should a name originally proposed for an aberration, or any other infrasubspecific category, be elevated by one of the subsequent authors to the species-group rank (i.e. the species or the subspecies), it takes the date and authorship of its elevation (cf. Code, Art 10b) and its previous infrasubspecific application remains irrelevant and immaterial. To avoid any subsequent confusion (cf. Reissinger, 1971) it should be pointed out here that Ribbe (1905) in the same paper distinguished clearly between infrasubspecific names for individual form (i.e. aberrations) and available names interpreted now as of subspecies-rank, which he in accordance with the predominating custom of the period called "varietas": *Satyrus actaea nevadensis* Ribbe 1905 and *Chrysephanus* [sic] *gordius granadensis* Ribbe 1905 were both originally designated as "var[ietas]."

Although the interpretation of the rank and status of the species-group and lower category names treated in the works of Seitz (1906-09, 1929-32) often presents considerable difficulties owing to ambiguity, it may be noted that Roeber (1907) retained unequivocally the rank of aberration for the taxon: "Ribbe found in Sierra d'Alfacar [sic] (Andalusia) an aberration which he calls *alfacariensis*: ♂ lighter yellow, the underside of the hindwing being more greyish yellow, ♀ above greenish white, similar to *edusa* ab. *helice* but with smaller black markings, the underside also being very similar to that of *helice*." (Quotation cited here is taken from the English edition of the book.)

Verity (1905-11) described a "race" of *Colias hyale hyale* Linnaeus, 1758 from southern Spain (i.e. "Andalusia") and named it *australis*. The original description was given on page 347, the full original combination on page XXXV of the same publication, and both were published at the same time (Verity, 1914); the necessity to consult the systematic index to establish the original combination and rank of all taxa named in Verity's

work cited above is given elsewhere (Kudrna, 1983, in print). Verity (1905-11) also defined the "race" as a infrasubspecific category, i.e. below the subspecies-rank, and the quadrinominal original combination *Colias hyale hyale australis* makes all abundantly clear. It may be noted that also races of monotypic species remain infrasubspecific and their names unavailable.

Verity (1916) described a seasonal form of *Colias hyale* (treated this time as a monotypic species) characteristic of the summer generation of the populations inhabiting southern Europe and named it *calida*; at the same time he designated syntypes (1 ♂, 1 ♀) from Toscana (C. Italy). Names proposed for seasonal forms are always treated as unavailable names as they are excluded from the Code; they are infrasubspecific names as they apply only to a part of the population(s) of the species, being exclusive of a certain season of the year. It should be mentioned here that also names applied to a selected population(s) as the whole cannot be treated as species-group names (cf. Code, draft, 3rd edition).

Verity & Querci (1923-24) used the name *calida* for the southern European race of *Colias hyale* characterized by the presence of the seasonal form *calida* among the summer generation(s); the paper was serialized and the page concerned was published in 1923. Verity & Querci (1923-24) provided no description of the race *calida*, however, a bibliographical reference is given to the original description of the seasonal form of the same name. A trinominal combination, *Colias hyale calida*, seems implied. The race *calida* includes three seasonal forms: *vernalis* Verity 1908 in the first generation, *calida* in the second and third generation and "extraord. gen. *hyale*, L." in the fourth generation. Verity's taxonomic category "race" has given much cause for concern owing to its ambiguity; it was—and still often is—quite thoughtlessly interpreted as an equivalent of the subspecies. The names originally proposed by Verity for races have therefore been usually treated as if they were available names of subspecies-rank as from the date of their first publication (cf. Cockayne, 1952). Verity made it abundantly clear on several occasions that his "race" had little, if anything, in common with the subspecies (Verity, 1905-11, 1912, 1929, 1940); he more or less replaced the subspecies with the "exerge" (Verity, 1925-26, 1929) in all but his early publications (e.g. Verity, 1905-11, also Turati & Verity, 1911, 1912) and placed the race one rank below it, i.e. as an infrasubspecific and consequently unavailable name; this is true even about all monotypic species where the race-name comes placed third in the implied trinominal original combination (Kudrna, 1983). The significance of the intentions of the original author has not been adequately appreciated in the present Code, but this has already been corrected by ICZN (cf. Code, draft, 3rd edition). Verity's "exerge" (i.e. subspecies) was determined by its hereditary characters (i.e. genetically fixed), his "race" was determined by its somatic characters (i.e. phenotypic) caused directly by environmental pressures. This means that

the "race" differed from the "exerge" (i.e. the higher category) in its phenotypic features while their genetic characters remained identical. The race was often denoted by the name of a form thought to be predominant or characteristic (though not necessarily exclusive) of it, or of one of its distinct broods in case of polyvoltine species. Such is the case of the name *calida* used for a seasonal form and applied by Verity & Querci (1923-24) to the race characterized by the presence, or predominance, of that seasonal form in its summer brood(s). The race does not exclude examples of other conspecific forms from its populations (i.e. so called "mixed" races of Verity), the "exerge" (i.e. subspecies) does precisely the opposite, it being exclusive to a definite geographical area; only where two such "exerges" of the same species meet they form a "contact zone" and can interbreed. The race has no definite range. In case of all monotypic species, the genetic characters are specific, the phenotypic features "racial." Before his indirect replacement of subspecies by the new fanciful term "exerge" Verity (1920: 146 in 1919-22) stated: "the term 'subspecies' I should restrict to particular groups of races which only just fall short of the definite group we call 'species'."

Bollow (1930) made the following interpretation of the names *calida* and *australis*: "For the very fine and large summer generation of southern Europe Verity chooses as typical representative the *hyale* flying in Tuscany and names it *calida*" and "Further large brightly coloured ♂♂ and for a great part also similarly coloured ♀♀ are shown by the race *australis* Vrt. from Andalusia. The black markings are often reduced." (Quotation from the English edition of the work.) The infrasubspecific status was retained.

Berger (1945) was first to recognize that *Colias hyale* consisted of two distinct species the adults of which differed only slightly but which had very distinct early stages, particularly the larvae, and one of them was a monophag feeding on *Hippocrepis comosa*. In his preliminary communication Berger (1945) cautiously avoided to propose a new name for the "new species" and called it simply after its foodplant to distinguish it for the oligophagous *Colias hyale*; he provided no description but suggested its identity with *Colias alfacariensis* of Ribbe (1905).

Berger (1948) published another preliminary paper on the two *Colias*-species which contained a brief but adequate description of adults and the early stages of the "new species", with notes on its biology and distribution chiefly in England; he also identified it as *Colias alfacariensis*. He elevated to the species-rank the aberration *alfacariensis* and, erroneously, retained the authorship and date of publication as: Ribbe 1905, Berger (1948) was apparently unaware of the consequences of the elevation of an unavailable name to the rank of species-group, i.e. that he, not Ribbe, became the author of the name, and that also the date of publication changed accordingly: *Colias alfacariensis* Berger 1948. In the circumstances, he

gave no information regarding the type-material (i.e. syntypes) of the new species and made no statement with regard to the type-locality; nonetheless, as he reported in his paper specifically *alfacariensis* from England, he used and listed English specimens when writing up his description of the species. It is important to state here that Berger's (1948) paper containing the original description of *alfacariensis* was published in August 1948.

A little earlier Berger & Fontaine (1947-48) started to publish a more detailed paper on *Colias alfacariensis* and dealt particularly with the biology and the early stages of both closely related species. The paper was serialized and the name *alfacariensis* was applied to the earlier published description, including also a detailed comparative study of adults, as late as in the last installment which appeared in December 1948. Berger & Fontaine (1947-48) attributed the authorship again to Ribbe 1905; they were apparently both unaware of the nomenclatorial consequences of their action. Also the second description satisfied the Code.

Hemming & Berger (1950) discussed the nomenclature of the new *Colias* and correctly observed that the name *Colias alfacariensis* became first available under the Code in 1948 and the author of that name was Berger. However, they were in error as they placed *Colias alfacariensis* Berger 1948 in synonymy and replaced it with *Colias australis*, the authorship and date of publication they gave to Verity 1911. This replacement was apparently suggested by F. Hemming who must have overlooked both the original combination stated by Verity (1905-11) and his definition of the race, either of which were alone adequate to show the infrasubspecific nature and the subsequent unavailability of the name *australis*. In fact, Hemming & Berger (1950) were the first authors to apply the name *australis* to the species identical with *Colias alfacariensis* Berger 1948.

Cockayne (1952) rejected both previously used names, i.e. *Colias alfacariensis* (regardless of authorship) and *Colias australis* Verity 1911 and pointed out that the oldest name for the species was *calida* Verity, with the date of publication 1923 when this was utilized for a race. He failed to observe that the authors of the paper were Verity & Querci and the infrasubspecific nature of the race in Verity's works. Cockayne's (1952) conclusions received little support and attention of subsequent authors, though the name *calida* was occasionally used chiefly for the "subspecies" of *australis* inhabiting central Europe, that is quite contradictory to both its original description and the type-locality given by Verity (1916).

Following the conclusions of Hemming & Berger (1950) the name *Colias australis* Verity 1911 became generally accepted by most of subsequent authors. There appeared a distinct need to provide an objective definition of the species by selection and designation of the name-bearing type. Riley (1954) located in the British Museum (Natural History) the rest of the type series that served Verity (1905-11) for the description of *Colias hyale hyale australis* Verity 1911 at his brief visit to the Museum while in London, after

only perfunctory examination of the unknown number of specimens. Riley (1954) pointed out the somewhat uncertain origin of the types and selected the lectotype (male). Warren (1954) aware of small differences usually present in male genitalia of the two species examined the genitalia of the lectotype; he pointed out that the selection of the specimen was unfortunate, if not questionable, as its genitalia were somewhat "transitional." There is no more need for this lectotype, perhaps a lucky solution in the circumstances.

Reissinger (1971) discussed the nomenclature of the species at considerable length and concluded that it should be named *Colias alfacariensis* Ribe 1905. His argument was based chiefly on facts irrelevant and/or immaterial from the nomenclatorial point of view and indicated his relative unawareness of both the principles of systematic zoology and the rules set out by the ICZN in the Code. Part of Reissinger's (1971) argument consists of misinterpretation of the known facts, such as the distinction Ribbe (1905) made between individual forms ("aberratio") and sub-species ("varietas").

The above perspective completes a taxonomic history full of errors which resulted in part from some unfortunate oversights of otherwise acknowledged entomologists. It is to be hoped that the name *Colias alfacariensis* Berger 1948 will soon replace the invalid names discussed here. It would seem most opportune to conclude this paper with the designation of the name-bearing type, i.e. the lectotype, of this species from the material that served Berger (1948) for his description. This would be best done in cooperation with the author himself, L. A. Berger. Unfortunately, all my earlier attempts to communicate with him failed to produce an answer. Should he decide to designate the lectotype from his syntypes, the selection of the right specimens is of utmost importance. It would seem that southern England should be the type-locality of *Colias alfacariensis* for the time being, to be later restricted according to lectotype (to be designated).

It may be useful to summarize here the original combinations of both infrasubspecific and available names cited in this paper:

- A) Index of unavailable (infrasubspecific) names:
 - Colias hyale alfacariensis* Ribbe 1905
 - Colias hyale hyale australis* Verity 1911
 - Colias hyale calida* Verity 1916
- B) List of available names for species (synonymy):
 - Colias alfacariensis* Berger 1948 (nec Ribbe 1905)
 - Colias australis* Hemming & Berger 1950 (nec Verity 1911)
 - Colias calida* Cockayne 1952 (nec Verity 1923)

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